

For Revised Syllabus Session 2024-25

# SOLUTIONS CHEMISTRY

**Chapter 5 Physical and Chemical Changes** 



#### Chapter – 5

#### **Physical and Chemical Changes**

#### **Exercise**

- **1.** Classify the changes involved in the following processes as physical or chemical changes:
  - a) Photosynthesis
  - b) Dissolving sugar in water
  - c) Burning of coal
  - d) Melting of wax
  - e) Beating aluminium to make aluminium foil
  - f) Digestion of food

#### **Answer:**

\* Note:

Chemical change is a change where a substance is changed and a new substance is formed.

Physical change: A physical properties change in which a substance undergoes a change in its physical properties is called a physical change. In such a change, no new substance is formed.

- (a), (c), (f)  $\rightarrow$  Chemical Changes.
- (a) Photosynthesis is a chemical process by which green plants convert light energy (Sunlight) into chemical energy (Carbohydrates).
- (c) Burning of coal is a chemical change because new substances carbon dioxide and water are formed.
- (f) Digestion of food is a chemical change as food is broken down into its constituent's chemicals by the help of enzymes.
- (b), (d), (e)  $\rightarrow$  Physical Changes.
- (b) Dissolving sugar in water is a physical change because when sugar molecules are mixed in water, they dissolved in water molecules and no new substance is formed.

- (d) Melting of wax is also physical change because there is no new substance is formed on melting of wax.
- (e) Beating aluminium to make aluminium foil is a physical change because no new substance is formed and only the physical properties like shape, size, etc. change.
- 2. State whether the following statements are true or false. In case a statement is false, write the corrected statement in your notebook.
  - a) Cutting of log of wood into pieces is a chemical change. (True/False)
  - b) Formation of manures from leaves is a physical change. (True/False)
  - c) Iron pipes coated with zinc do not get rusted easily. (True/False)
  - d) Iron and rust are the same substances. (True/False)
  - e) Condensation of steam is not a chemical change. (True/False)

#### **Answer:**

(a) False.

Cutting of log of wood into pieces is a physical change because no new substance is formed and only the physical properties like shape, size, etc. change.

(b) False.

Formation of manures from leaves is a chemical change because manure had different composition of leaves. tamso ma jyotirgamaya

(c) True.

Iron pipes coated with zinc do not get rusted easily because zinc prevent iron articles from coming in contact with oxygen, or water, or both.

(d) False.

When iron piece is left in the open for some time, it acquires a film of brownish substance called rust. Hence, iron and rust are different substances.

(e) True.

Condensation of steam is a physical change because water changes its state from vapour to solid.

3.	Fill in the blanks in the following statements:
	a) When carbon dioxide is passed through lime water, it turns
	milky due to the formation of
	b) The chemical name of baking soda is
	c) Two methods by which rusting of iron can be prevented
	areand
	d) Change in which onlyproperties of a substance
	change are called physical changes.
	e) Changes in which new substances are formed are called
	changes.

#### **Answer:**

(a) When carbon dioxide is passed through lime water, it turns milky due to the formation of Calcium carbonate.

When carbon dioxide is passed through lime water, calcium carbonate is formed, which makes lime water milky. It is a chemical process.

- (b) The chemical name of baking soda is sodium hydrogen carbonate. It is popularly called cooking soda. The chemical formula of baking soda is NaHCO<sub>3</sub>.
- (c) Two methods by which rusting of iron can be prevented are painting and galvanization.

Painting and galvanization are two methods to prevent iron articles from coming in contact with oxygen, or water, or both. Thus, prevent rusting of iron.

(d) Change in which only physical properties of a substance change are called physical changes.

A physical change is the one in which a substance undergoes a change in its physical properties. In such a change, no new substance is formed.

(e) Changes in which new substances are formed are called chemical change.

Chemical change is a change where a substance is changed and a new substance is formed.

**4.** When baking soda is mixed with lemon juice, bubbles are formed with the evolution of gas. What type of change is it? Explain.

#### **Answer:**

When baking soda is mixed with lemon juice, a chemical change occurs. In this reaction, new substances like carbon dioxide is formed. Since a new substance, carbon dioxide is formed so it is a chemical process.

**5.** When a candle burns, both physical and chemical changes take place. Identify these changes. Give another example of a familiar process in which both the chemical and physical changes take place.

#### Answer: tamso ma jyotirgamaya

1) When a candle burns, both physical and chemical changes take place.

**Physical change**: Melting of wax is a physical change since it again turns into solid wax on cooling.

**Chemical change**: The wax near to flame burns and gives new substances like carbon dioxide.

2) Lighting torch bulb using the dry cell is another example where both physical and chemical changes take place.

**Physical change**: The lighting of a bulb is a physical change since no new substance is formed.

Chemical change: The current is obtained from the chemical substances present inside the dry cell. Inside the cell, the chemicals react with each other and produce light substances and hence the cell ultimately becomes useless. So, it is a chemical change.

**6.** How would you show that setting of a curd is a chemical change?

#### **Answer:**

Setting of curd is a chemical change because once curd is formed, milk cannot be reobtained from it. The new substance i.e., curd is different from the milk in taste, smell and other chemical properties.

7. Explain why burning of wood and cutting it into small pieces are considered as two different changes.

#### Answer:

Burning of wood is a chemical change because in burning new substance like ash, smoke, etc. are formed.

But cutting it into small pieces is physical change because no new substances are formed. Only the physical properties like shape, size, etc. change.

**8.** Describe how crystals of copper sulphate are prepared.

#### Answer:

Crystals of copper sulphate are prepared by the method of crystallization. It is an example of physical change. The process is as follows:

- (1) A cupful of water is taken in a beaker and a few drops of dilute sulphuric acid are added in it.
- (2) The water is then heated and when it starts boiling, copper sulphate powder is added slowly with stirring.
- (3) Copper sulphate powder is added continuously till no more powder can be dissolved.
- (4) Then solution is filtered and allowed to cool down.
- (5) Do not disturb the solution, when it is cooling.
- (6) Crystals of copper sulphate slowly form at the bottom of the beaker.
- **9.** Explain how painting of an iron gate prevents it from rusting.

#### **Answer:**

Rusting of iron articles is due to the exposure of iron to the atmosphere for some time. Painting of iron gate prevents iron from rusting because the layer of paint prevents the iron gate to come in direct contact of atmosphere, water and both. Thus, rusting of iron can be prevented.

**10.** Explain why rusting of iron objects is faster in coastal areas than in deserts.

#### Answer: tamso ma jyotirgamaya

Both air and moisture are necessary conditions for rusting to take place. In coastal areas, the amount of moisture present in air is higher than that in desert areas. So, the process of rusting is faster in coastal areas than in deserts.

11. The gas we use in the kitchen is called liquefied petroleum gas (LPG). In the cylinder it exists as a liquid. When it comes out from

the cylinder it becomes a gas (Change -A) then it burns (Change -B). The following statements pertain to these changes. Choose the correct one.

- (i) Process A is a chemical change.
- (ii) Process B is a chemical change.
- (iii) Both processes A and B are chemical changes.
- (iv) None of these processes is a chemical change.

#### **Answer:**

Process A is a physical change because no new substance is formed. The LPG in cylinder is in liquid form because of high pressure. When it comes out from the cylinder, it turns into a gaseous form. Thus, it is a physical change.

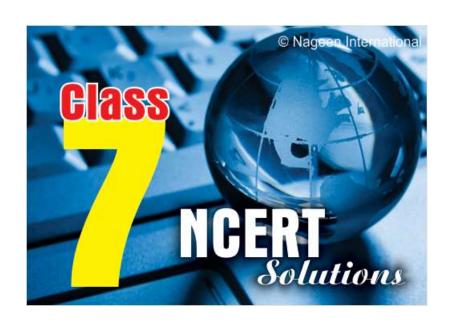
Process B is a chemical change because burning of gas is a chemical change.

- **12.** Anaerobic bacteria digest animal waste and produce biogas (Change A). The biogas is then burnt as fuel (Change B). The following statements pertain to these changes. Choose the correct one.
  - (i) Process A is a chemical change.
  - (ii) Process -B is a chemical change.
  - (iii) Both processes A and B are chemical changes.
  - (iv) None of these processes is a chemical change.

#### **Answer:**

Production of biogas from animal waste by the action of bacteria is chemical change because new substance biogas is formed. Thus, process A is a chemical change. Biogas works as fuel and produces heat. Hence, process B is also a chemical change.

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#### Kindergarten to Class XII (For Teachers Only)



**Kindergarten** 

Class 12 (Commerce)

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#### Senior Secondary Groups (XI & XII For Teachers Only)









































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Principal's Group





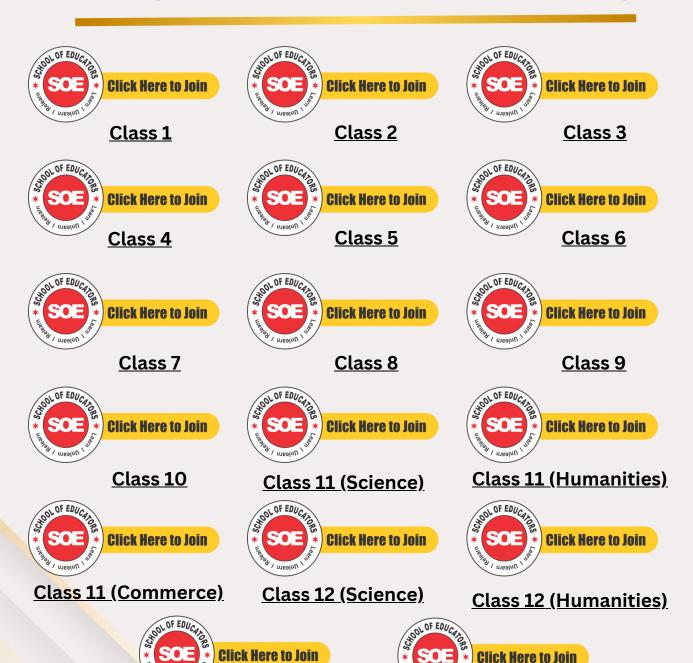
<u>Teachers Jobs</u>

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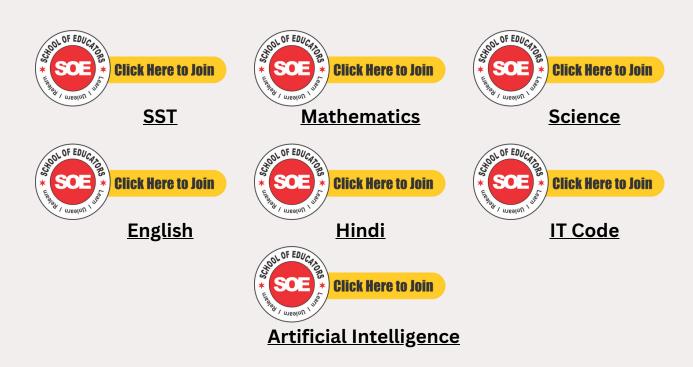
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#### **Kindergarten to Class XII (For Students Only)**

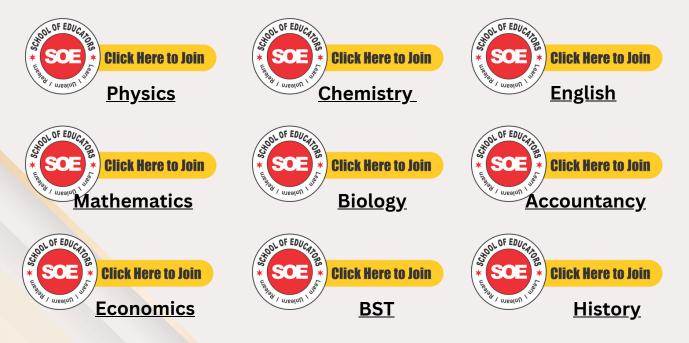




# Subject Wise Secondary and Senior Secondary Groups (IX & X For Students Only) Secondary Groups (IX & X)



#### Senior Secondary Groups (XI & XII For Students Only)













































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- 2. Help your fellow educators by answering their queries.
- 3. Watch and engage with shared videos in the group.
- 4. Distribute WhatsApp group resources among your students.
- 5. Encourage your colleagues to join these groups.

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- 2. After sharing resources with students, consider deleting outdated data if necessary.
- 3. It's a NO Nuisance groups, single nuisance and you will be removed.
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Mass Media - Being Media **Literate** 



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Coding



Data Science (Class VIII only)



Augmented Reality / Virtual Reality



**Digital Citizenship** 



Life Cycle of Medicine & **Vaccine** 



Things you should know about keeping Medicines at home



What to do when Doctor is not around



**Humanity & Covid-19** 



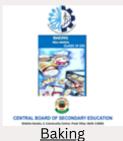








Food Preservation



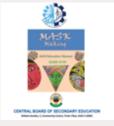
<u>Baking</u>



<u>Herbal Heritage</u>



<u>Khadi</u>



Mask Making



Mass Media



Making of a Graphic Novel



<u>Embroidery</u>



<u>Embroidery</u>



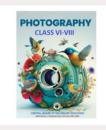
**Rockets** 



**Satellites** 



<u>Application of</u> <u>Satellites</u>



<u>Photography</u>

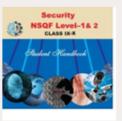
#### SKILL SUBJECTS AT SECONDARY LEVEL (CLASSES IX - X)



Retail



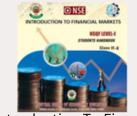
Information Technology



**Security** 



<u>Automotive</u>



Introduction To Financial Markets



Introduction To Tourism



Beauty & Wellness



<u>Agriculture</u>



**Food Production** 



**Front Office Operations** 



**Banking & Insurance** 



Marketing & Sales



**Health Care** 



<u>Apparel</u>



Multi Media



Multi Skill Foundation **Course** 



Artificial Intelligence



Physical Activity Trainer



**Data Science** 



**Electronics & Hardware** (NEW)



Foundation Skills For Sciences (Pharmaceutical & Biotechnology)(NEW)



**Design Thinking & Innovation (NEW)** 

#### SKILL SUBJECTS AT SR. SEC. LEVEL (CLASSES XI - XII)



**Retail** 



<u>InformationTechnology</u>



**Web Application** 



Automotive



Financial Markets Management



**Tourism** 



**Beauty & Wellness** 



**Agriculture** 



**Food Production** 



**Front Office Operations** 



**Banking** 

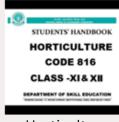


**Marketing** 





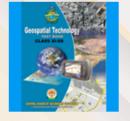
Insurance



Horticulture



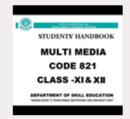
Typography & Comp. **Application** 



Geospatial Technology



**Electronic Technology** 



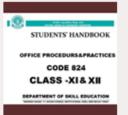
Multi-Media



**Taxation** 



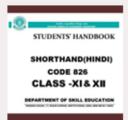
Cost Accounting



Office Procedures & Practices



Shorthand (English)



Shorthand (Hindi)



<u>Air-Conditioning &</u> <u>Refrigeration</u>



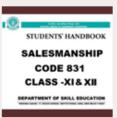
<u>Medical Diagnostics</u>



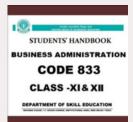
Textile Design



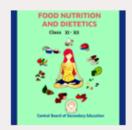
<u>Design</u>



<u>Salesmanship</u>



Business Administration



Food Nutrition & Dietetics



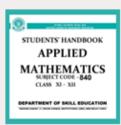
Mass Media Studies



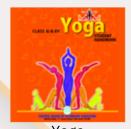
<u>Library & Information</u> Science



**Fashion Studies** 



**Applied Mathematics** 



<u>Yoga</u>



<u>Early Childhood Care &</u> <u>Education</u>



<u>Artificial Intelligence</u>



**Data Science** 



Physical Activity
Trainer(new)



<u>Land Transportation</u> <u>Associate (NEW)</u>



Electronics & Hardware (NEW)



<u>Design Thinking &</u> <u>Innovation (NEW)</u>

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#### Kindergarten to Class XII





























Class 11 (Science)

Class 11 (Humanities)

Class 11 (Commerce)







Class 12 (Science)

Class 12 (Humanities)







#### **Subject Wise Secondary and Senior Secondary Groups IX & X**

#### **Secondary Groups (IX & X)**









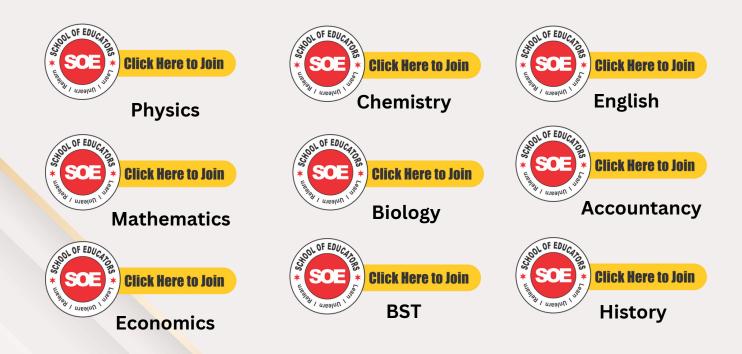
Hindi-A



IT Code-402

**English** 

#### **Senior Secondary Groups XI & XII**





Geography



Sociology



**Hindi Elective** 



**Hindi Core** 

**Psychology** 

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**Political Science** 



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Comp. Science





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IIT/NEET



**Artifical intelligence** 



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